

Self-Esteem and Pressure Students in Mathematics Classes Experience

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ABSTRACT

Students frequently encounter the demand to achieve high levels of competency in mathematics, a requirement that can originate from multiple sources, including parents, educators, and society as a whole. The perceived pressure faced by pupils may be influenced by their self-perception. The self-perception of students is a component of their self-esteem. The primary aim of this research is to evaluate the extent of self-esteem demonstrated by students in mathematics classrooms at the junior high school level. The research encompassed a cohort of 75 adolescents attending junior high school who were residents of a specific city located inside the Aceh region. The data collection procedure encompassed the implementation of self-esteem surveys and a limited number of interviews. The study's results reveal that 20% of participants reported experiencing a sense of security, whilst 35% reported experiencing a sense of identity. Furthermore, it was found that 30% of the participants indicated a feeling of belonging, although just 17% claimed a sense of competence. Finally, the proportion of individuals who indicated a perception of worth was 23%. The results of this survey suggest that there remains a pervasive perception of low self-esteem among students. A considerable proportion of kids encounter sensations of anxiety in the realm of mathematical education, notwithstanding the endeavors of educators to incorporate a stimulating teaching methodology.

Keywords: Self-esteem; Pressure; Mathematics Classes

1. Introduction

Self-esteem and academic pressure are two significant variables that students encounter within the context of mathematical education. Understanding this information can be beneficial for enhancing the process of class planning, as it enables the identification of strengths and shortcomings that may have remained undiscovered (ABD ALGANI & HAJ, 2020; Setiawan et al., 2022). In a study conducted by Hareesol Khun, it was shown that self-esteem plays a significant role in developing pupils' cognitive processes and problem-solving strategies. This observation aligns with research conducted by Fisher and Kusumah, wherein a favorable association was discovered between student academic performance and their level of self-esteem in the domain of mathematics (Lavasani & Khandan, 2020). Moreover, it has been suggested that self-esteem is a significant internal component that may influence the achievement of mathematics education (Andreassen et al., 2017). According (Moyano et al., 2020), there is a positive correlation between students' self-confidence in learning mathematics and their willingness to openly share their opinions and ideas. Furthermore, individuals in this group exhibit a higher propensity to openly articulate their viewpoints and exhibit a willingness to undertake bold approaches when addressing challenges. Conversely, those with diminished self-confidence in the domain of mathematics may have difficulties in decision-making processes and exhibit a pronounced dependence on rote memorization as opposed to comprehending underlying principles. According to Algani (2020), possessing a heightened sense of self-esteem in the field of mathematics has a beneficial influence on both academic accomplishments and student performance. The possession of a strong sense of self-esteem in the field of mathematics has been shown to have a favorable correlation with academic success and student achievement (Chilca, 2017; Hawi & Samaha, 2017; R et al., 2021). In addition to fostering increased levels of academic achievement, it also engenders a sense of self-value and efficacy among students throughout the educational journey.

One determinant impacting students' self-esteem in the context of mathematics education is the inherent pressure they experience. This inherent pressure can arise from various factors, including but not

limited to societal norms and expectations, parental influence, and apprehension of experiencing failure. The inherent pressure experienced in relation to mathematics can foster a pessimistic cognitive state, resulting in diminished self-worth and impeding the acquisition of knowledge and skills. In order to effectively address this issue, it is imperative for educators to understand the implications of academic pressure on students' self-perception in the context of mathematical education. By acknowledging and mitigating the stress that students may experience, educators have the ability to establish a nurturing and motivating educational environment. The importance of accurate weather predictions in the contemporary dynamic global environment cannot be overemphasized. Understanding this information can be beneficial for enhancing the process of class preparation, as it enables the identification of strengths and weaknesses that may have remained undiscovered. Based on the findings of a research study, it has been shown that a significant proportion, around 60%, of achievement in the field of mathematics is influenced by an individual's level of self-esteem.

The academic performance and overall attitudes towards mathematics may be negatively affected by the pressure experienced by students during the learning process. According to the scholarly work of Ziegler and Loos, it has been observed that students have the propensity to experience math anxiety, which can subsequently result in diminished motivation and potential constraints on their career prospects within the realm of mathematics (Escarez Jr. & Ching, 2022). Math anxiety is a psychological phenomenon characterized by the experience of tension and anxiety that hinders the cognitive processes involved in the manipulation and resolution of mathematical issues throughout a range of everyday and academic contexts (Beilock & Maloney, 2015; Jiang et al., 2021). The experience of anxiety in relation to mathematics can arise from multiple factors (Szczygieł & Pieronkiewicz, 2022), encompassing environmental anxiety stemming from challenges encountered within the classroom setting, the influence of parental expectations, and the impression of mathematics as a discipline characterized by rigidity and inaccessibility (Williamson, 2008). In addition, it has been observed that math anxiety might have a substantial impact on a student's capacity to cultivate their mathematical reasoning abilities (Luttenberger et al., 2018; Nida et al., 2020; Samuel & Warner, 2021). Emphasize that math anxiety can give rise to unfavorable attitudes and beliefs regarding mathematics, hence impeding a student's capacity to acquire and execute mathematical activities proficiently (Bornaa et al., 2023). The academic performance and overall attitudes towards the topic of mathematics might be negatively impacted by the pressure experienced by pupils during the learning process. Addressing and mitigating the aforementioned pressure is of paramount importance in order to foster a conducive learning environment for students and facilitate their attainment of mathematical proficiency.

In the contemporary context of dynamic societal transformations, the cognitive burden experienced by students during the acquisition of mathematical knowledge might exert a detrimental influence on their academic achievements and overall attitudes towards the discipline. This study aims to assess the level of self-esteem exhibited by junior high school students in mathematics classes and elucidate the emotions experienced by these students throughout their involvement with the subject. The significance of self-esteem in the context of mathematics learning is duly acknowledged.

2. Methods

The present study adopts a descriptive-qualitative approach and encompasses a sample of 75 adolescents enrolled in junior high school. These participants were selected from a specific city situated in the Aceh region. The data for the study was obtained through individual semi-structured audio interviews and focus group sessions. The duration of each interview, on average, was fifteen minutes, focusing mostly on the subjective experiences of students in mathematics classrooms and their coping mechanisms for managing negative emotions. In the interim, data pertaining to self-esteem was gathered through the utilization of a questionnaire that had been previously devised by scholars. Subsequently, it was ascertained that the questionnaire possessed the necessary attributes of validity and reliability, so rendering it suitable for implementation in the study.

3. Results And Discussion

This study commences by examining the significance of self-esteem in relation to pupils' ability to solve mathematics problems. Nevertheless, there were advancements in the research methodology. Numerous studies have revealed the presence of significant levels of pressure experienced by both students and teachers during the educational process inside the classroom setting. However, to ensure the research maintains a clear focus, the investigator exclusively examined the students' self-esteem levels and the extent of pressure experienced within the context of their mathematics classes.

The findings of the study indicated that a notable proportion of participants, specifically 20%, reported perceiving feelings of security. The data presented indicate that students perceive feelings of insecurity during their mathematics classes. The significance of feelings of security lies in their ability to enhance individuals' well-being and positively impact their overall achievement in the field of mathematical education. Based on the findings from the conducted interviews, it was observed that a significant majority of students expressed feelings of insecurity within the mathematics classroom environment, primarily stemming from their consistent inability to successfully solve mathematical problems. The students perceive the assignments provided by the instructor as consistently challenging, although they find the examples provided to be rather straightforward (Mata-Pereira & da Ponte, 2017; Scager et al., 2017). The researcher performed an interview with a student, inquiring about the specific questions posed by the teacher that elicited feelings of pressure.

Approximately 80% of the student population responded to the query, "Do you possess any inquiries?" Do you comprehend the content that is being elucidated? Many students experience a sense of pressure when confronted with the task of responding to this particular inquiry. According to reports, it was indicated that if students affirmed their understanding of the instructor's explanation, they would be asked to solve the questions in a public setting. Conversely, if students provided an incorrect response, the teacher's reaction was expected to be one of displeasure. However, if students express their lack of understanding, it is plausible that the instructor may also become displeased. In contrast, the inquiries posed by the instructor are designed to transform the educational endeavor into a daunting experience (Wahyuni et al., 2023).

According to the findings, a total of 35% of participants indicated that they had encountered a sense of identity formation while engaging in the process of learning. It is postulated that students who possess very high abilities may experience adverse interpersonal relationships due to the intimidating nature of heightened levels of social exclusion. The experience of fear among students can be attributed to various factors, one of which is the implementation of teaching methodologies by educators that are excessively strict, derisive, or belittling in nature. This phenomenon has the potential to evoke feelings of intimidation and discomfort among students. One student additionally expressed that their instructor frequently engaged in comparing their performance with that of other students in the class, either directly or by publicly discussing such comparisons. Several students argued that their instructors also offered an abundance of unproductive criticism or undermined them without offering sufficient direction or assistance. Some individuals argue that their educators impose an excessive amount of performance pressure by assigning tasks that are unrealistic or expecting outcomes that exceed their capabilities. The experience elicits a sense of discomfort among students in the context of their mathematics education.

Furthermore, the findings derived from the administered questionnaire revealed that a notable proportion of 30% of the participants exhibited a discernible sense of belonging. This finding suggests that there continues to be a limited sense of affiliation among students, implying that educators have encountered challenges in their individual efforts to enhance students' academic achievements in the field of mathematics. Based on the findings of the search results, it has been observed that students' level of ownership in the process of mathematics learning might be diminished as a result of several factors, such as insufficient perceptions of mathematics and teachers' assumptions regarding the inherent mathematical genius of students. The emphasis placed by educators on fixed facts and procedural knowledge in the teaching of mathematics has been identified as a potential factor that may contribute to decreased academic performance and reduced self-confidence among students.

Mathematics anxiety is a prevalent issue that can result in students' avoidance of mathematics and their discomfort with the subject, ultimately leading to a diminished sense of ownership (Neelofar et al., 2022; Stoehr, 2017).

In addition, it is worth noting that kids may fail to develop a genuine feeling of ownership over the mathematics they engage with when their primary attention lies on seeking approval from educators, parents, and classmates, while actively avoiding any form of punishment or negative feedback. Less privileged students have distinct problems in mathematics, such as stereotype fear and math anxiety, implicit biases exhibited by teachers, and tracking. These challenges have the potential to perpetuate unfairness and hinder students' sense of ownership in the subject (Avraamidou, 2022; Dover et al., 2020; Sousa, 2021). In order to enhance students' sense of ownership in the field of mathematics, certain instructional systems, such as Cognitively Guided Instruction, prioritize sense-making as the central component of instructional activities (Ganon-Shilon et al., 2022). Establishing an educational environment that fosters a sense of belonging and self-efficacy among students has the potential to alleviate the negative effects of stereotype threat and math anxiety (Sousa, 2021). The provision of high-quality teaching resources and professional learning opportunities that are linked with the Standards for Mathematical Practice can facilitate active involvement in these activities and enhance student engagement (Gleason et al., 2017).

Furthermore, students only have 17% a sense of competence in learning mathematics. The search results indicate that students' sense of competence in mathematics learning can be diminished by several factors. These factors include: (1) a deficiency in self-confidence and negative attitudes towards mathematics (Balentyne & Varga, 2017); (2) inadequate understanding of fundamental mathematical concepts (Sithole et al., 2017); (3) insufficient motivation and interest (Balentyne & Varga, 2017); (4) an ineffective mathematics curriculum implemented in schools (Mazana et al., 2018); (5) a shortage of qualified mathematics teachers (Toropova et al., 2021); and (6) language barriers (Wahyuni & Zaiyar, 2021).

The inadequate perception of students' mathematical competence has been found to be associated with unfavorable academic outcomes, including subpar performance, increased anxiety, and increased susceptibility to depression (Wahyuni & Zaiyar, 2021). In order to address this issue, research has found that interventions aiming to boost students' self-efficacy, sense of belonging, and involvement in mathematics have proven to be effective (Verdín & Godwin, 2018). The implementation of mathematics education adhering to the Standards for Mathematical Practice, along with providing professional development opportunities for teachers, has the potential to improve students' learning outcomes and cultivate a stronger sense of competence. Additionally, it is possible that students may fail to develop a sense of ownership over the mathematics they are learning when their main focus is on receiving praise from their teachers, parents, and peers, while actively avoiding punishment or negative feedback. These challenges have the potential to perpetuate unfairness and hinder students' sense of ownership in the subject (Dover et al., 2020). In order to enhance students' sense of ownership in the field of mathematics, certain instructional systems, such as Cognitively Guided Instruction, prioritize the integration of sense-making into instructional activities.

Last but not least, 23% of individuals possessed valuable perceptions. According to inquiry results, this has multiple causes. Some students explained that they had exerted great effort to comprehend and solve mathematical problems, but ultimately failed. The question is whether or not they recover from this setback. The response is that they have attempted to solve the problem, but the allotted time is frequently insufficient, leaving them unable to recover from their failure. They seek faster solutions with the assistance of colleagues. This demonstrates not that students do not struggle, but that they frequently lack leisure for self-reflection. And teachers do not allow them to speak the truth during the learning process. On the other hand, some students believe that mathematics instructors only pay attention to students with high or low abilities (Genc & Erbas, 2019). Those with average abilities, meanwhile, feel neglected. They struggle to rise and comprehend mathematics on their own. Consequently, there are quite a few students who dislike math. When queried by students, have they ever attempted to convey their emotions to the instructor? They responded that they attempted to be truthful but were ultimately intimidated by the teacher.

Researchers recognize that instructors have limited time for classroom instruction. Therefore, it cannot unite the entire class. However, the shortage of instructors will cause students to experience pressure during the learning process. Moreover, mastering mathematics involves more than just problem-solving; it has a deeper essence. Teachers should also demonstrate humility and receptivity to criticism provided by students. In order to attain mathematical learning harmony.

4. Conclusions

The findings of the study indicate that 20% of participants reported experiencing a feeling of security, whilst 35% reported experiencing a sense of identity. Additionally, the study revealed that 30% of individuals reported experiencing a sense of belonging, whereas just 17% reported feeling a sense of competence. Ultimately, the percentage of respondents who expressed a view of value amounted to 23%. The findings of this study indicate that there continues to be a widespread perception of diminished self-esteem among students. A significant number of children experience feelings of anxiety within the context of mathematics education, despite the efforts of educators to implement an engaging instructional approach. The present study revealed that the attitudes of both students and teachers, specifically their humility, exerted a notable impact on the degree of pressure encountered by students within the realm of mathematical education. Nevertheless, the present study did not conduct a thorough investigation of the subject of humility and its associated effects. Hence, it is advisable for future scholars to explore the impacts of humble attitudes through utilizing a personality assessment strategy that incorporates multimethod measuring strategies, as this is considered the most reliable and accurate methodology. Furthermore, it is recommended that future studies prioritize investigating the degree to which individuals possess a relatively precise picture of their own identities.

5. References

- ABD ALGANI, Y., & HAJ, A. (2020). Thinking Styles of New Mathematics Teachers and Their Relation to Self-Esteem. *International E-Journal of Educational Studies*, 4(8), 157–166. <https://doi.org/10.31458/iejcs.707401>
- Andreassen, C., Pallese, S., & D. Griffiths, M. (2017). Addictive use of social media, narcissism, and self-esteem. *Addictive Behaviors*, 64, 287–293. http://irep.ntu.ac.uk/id/eprint/27358/1/PubSub5118_Griffiths.pdf
- Avraamidou, L. (2022). Identities in/out of physics and the politics of recognition. *Journal of Research in Science Teaching*, 59(1), 58–94. <https://doi.org/10.1002/tea.21721>
- Balentyne, P., & Varga, M. A. (2017). Attitudes and achievement in a self-paced blended mathematics course. *Journal of Online Learning Research*, 3(1), 55–72.
- Beilock, S. L., & Maloney, E. A. (2015). Math Anxiety: A Factor in Math Achievement Not to Be Ignored. *Policy Insights from the Behavioral and Brain Sciences*, 2(1), 4–12. <https://doi.org/10.1177/2372732215601438>
- Bornaa, C. S., Rahaman, H. A., & Iddrisu, A. B. (2023). Mathematics Anxiety and Academic Performance of Senior High School Students in Sagnarigu Municipality, Ghana. *East African Journal of Education Studies*, 6(2), 323–342. <https://doi.org/10.37284/eajes.6.2.1358>
- Chilca, M. L. (2017). Self-Esteem, Study Habits and Academic Performance Among University Students. *Propósitos y Representaciones*, 5(1), 101–127.
- Dover, T. L., Kaiser, C. R., & Major, B. (2020). Mixed Signals: The Unintended Effects of Diversity Initiatives. *Social Issues and Policy Review*, 14(1), 152–181. <https://doi.org/10.1111/sipr.12059>
- Escarez Jr., Y. F. D., & Ching, D. A. (2022). Math Anxiety and Mathematical Representations of Grade 7 Students. *International Journal of Educational Management and Development Studies*, 3(1). <https://doi.org/10.53378/352868>

- Ganon-Shilon, S., Shaked, H., & Schechter, C. (2022). Principals' voices pertaining to shared sense-making processes within a generally-outlined pedagogical reform implementation. *International Journal of Leadership in Education*, 25(6), 941–965. <https://doi.org/10.1080/13603124.2020.1770864>
- Genc, M., & Erbas, A. K. (2019). Secondary mathematics teachers' conceptions of mathematical literacy. *International Journal of Education in Mathematics, Science and Technology*, 7(3), 222–237.
- Gleason, J., Livers, S., & Zelkowski, J. (2017). Mathematics Classroom Observation Protocol for Practices (MCOP2): A validation study. *Investigations in Mathematics Learning*, 9(3), 111–129. <https://doi.org/10.1080/19477503.2017.1308697>
- Hawi, N. S., & Samaha, M. (2017). The Relations Among Social Media Addiction, Self-Esteem, and Life Satisfaction in University Students. *Social Science Computer Review*, 35(5), 576–586. <https://doi.org/10.1177/0894439316660340>
- Jiang, R., Liu, R. de, Star, J., Zhen, R., Wang, J., Hong, W., Jiang, S., Sun, Y., & Fu, X. (2021). How mathematics anxiety affects students' inflexible perseverance in mathematics problem-solving: Examining the mediating role of cognitive reflection. *British Journal of Educational Psychology*, 91(1), 237–260. <https://doi.org/10.1111/bjep.12364>
- Lavasani, M. G., & Khandan, F. (2020). Cypriot Journal of Educational. *Cypriot Journal of Education*, 2(3), 61–74. <https://doi.org/10.18844/cjes.v>
- Luttenberger, S., Wimmer, S., & Paechter, M. (2018). Spotlight on math anxiety. *Psychology Research and Behavior Management*, 11(2018), 311–322. <https://doi.org/10.2147/PRBM.S141421>
- Mata-Pereira, J., & da Ponte, J. P. (2017). Enhancing students' mathematical reasoning in the classroom: teacher actions facilitating generalization and justification. *Educational Studies in Mathematics*, 96(2), 169–186. <https://doi.org/10.1007/s10649-017-9773-4>
- Mazana, M. Y., Montero, C. S., & Casmir, R. O. (2018). Investigating Students' Attitude towards Learning Mathematics. *International Electronic Journal of Mathematics Education*, 14(1), 207–231. <https://doi.org/10.29333/iejme/3997>
- Moyano, N., Quílez-Robres, A., & Pascual, A. C. (2020). Self-esteem and motivation for learning in academic achievement: The mediating role of reasoning and verbal fluidity. *Sustainability (Switzerland)*, 12(14), 1–14. <https://doi.org/10.3390/su12145768>
- Neelofar, Rajoria, Y. K., Alsaraireh, I., & Boadh, R. (2022). The Initial Investigation of Mathematical Anxiety & Phobia: It's Solution in Middle School Students. *Journal of Positive School Psychology*, 6(6), 8323–8328. <http://journalppw.com>
- Nida, N. K., Usodo, B., & Sari Saputro, D. R. (2020). The blended learning with Whatsapp media on Mathematics creative thinking skills and math anxiety. *Journal of Education and Learning (EduLearn)*, 14(2), 307–314. <https://doi.org/10.11591/edulearn.v14i2.16233>
- R, Z., Fitriawan, D., Yusmin, E., Nursangaji, A., & Mirza, A. (2021). Corrective Feedback, Self-Esteem and Mathematics Learning Outcomes. *Al-Jabar : Jurnal Pendidikan Matematika*, 12(1), 121–132. <https://doi.org/10.24042/ajpm.v12i1.8659>
- Samuel, T. S., & Warner, J. (2021). “I Can Math!”: Reducing Math Anxiety and Increasing Math Self-Efficacy Using a Mindfulness and Growth Mindset-Based Intervention in First-Year Students. *Community College Journal of Research and Practice*, 45(3), 205–222. <https://doi.org/10.1080/10668926.2019.1666063>
- Scager, K., Akkerman, S. F., Pilot, A., & Wubbels, T. (2017). Teacher dilemmas in challenging students in higher education. *Teaching in Higher Education*, 22(3), 318–335. <https://doi.org/10.1080/13562517.2016.1248392>
- Setiawan, H., Hendriana, H., Sabandar, J., & Fitriani, N. (2022). The Effect Of Self Confidence On The Ability Of Understanding Mathematical Concepts Of Junior High School Students On The Triangle

- And Quarter Matter. *Al Khawarizmi: Jurnal Pendidikan Dan Pembelajaran Matematika*, 6(1), 13. <https://doi.org/10.22373/jppm.v6i1.13102>
- Sithole, A., Chiyaka, E. T., McCarthy, P., Mupinga, D. M., Bucklein, B. K., & Kibirige, J. (2017). Student Attraction, Persistence and Retention in STEM Programs: Successes and Continuing Challenges. *Higher Education Studies*, 7(1), 46. <https://doi.org/10.5539/hes.v7n1p46>
- Sousa, A. N. (2021). *Journal of Diversity in Higher Education*. 2023. <https://search.proquest.com/openview/c7469178dd1595e5ef6599cfd9129201/1?pq-origsite=gscholar&cbl=60942>
- Stoehr, K. J. (2017). Mathematics Anxiety: One Size Does Not Fit All. *Journal of Teacher Education*, 68(1), 69–84. <https://doi.org/10.1177/0022487116676316>
- Szczygieł, M., & Pieronkiewicz, B. (2022). Exploring the nature of math anxiety in young children: Intensity, prevalence, reasons. *Mathematical Thinking and Learning*, 24(3), 248–266. <https://doi.org/10.1080/10986065.2021.1882363>
- Toropova, A., Myrberg, E., & Johansson, S. (2021). Teacher job satisfaction: the importance of school working conditions and teacher characteristics. *Educational Review*, 73(1), 71–97. <https://doi.org/10.1080/00131911.2019.1705247>
- Verdín, D., & Godwin, A. (2018). Exploring latina first-generation college students' multiple identities, self-efficacy, and institutional integration to inform achievement in engineering. *Journal of Women and Minorities in Science and Engineering*, 24(3), 261–290. <https://doi.org/10.1615/JWOMENMINORSCIENENG.2018018667>
- Wahyuni, & Zaiyar, M. (2021). Persepsi Guru Sekolah Dasar Terhadap Penalaran Matematika. *Jurnal Ilmiah Pendidikan Matematika Al Qalasadi*, 5(2), 128–132. <https://doi.org/10.32505/qalasadi.v5i2.3302>
- Wahyuni, Zaiyar, M., Saragih, S., & Napitupulu, E. (2023). Students talk about the difficulties they have in solving math problems. *Al-Jabar: Jurnal Pendidikan Matematika*, 14(1), 181–190.
- Williamson, A. (2008). How Do We 'Think'? *Brief Psychological Interventions in Clinical Practice*, 31–39. <https://doi.org/10.1002/9780470773260.ch3>